ISSN: 2320-9267

Indian Journal of Pharmaceutical and Biological Research (IJPBR)

Journal homepage: www.ijpbr.in

RESEARCH ARTICLE

Diagnostic utility of ki67 and cyclin D1 immunostaining in differentiating psoriasis from psoriasiform dermatitis: A clinicopathological and immunohistochemical study

Ishita Shahi[1], Shambhavi Tripathi[2], Poorvi Mathur[3], Sanjay Agarwal[4]

ABSTRACT

Background: Differentiating psoriasis from psoriasiform dermatitis is often challenging due to overlapping clinical and histopathological features. Immunohistochemical markers such as Ki-67 and Cyclin D1 may aid in improving diagnostic accuracy.

Aim: To evaluate the diagnostic utility of Ki-67 and Cyclin D1 immunostaining in distinguishing psoriasis from psoriasiform dermatitis.

Methods: A prospective study was conducted on 70 skin biopsy samples. Histopathological examination and immunohistochemical staining for Ki-67 and Cyclin D1 were performed. Statistical analysis was done using appropriate tests with $p < 0.05$ considered significant.

Results: Ki-67 and Cyclin D1 expression levels were significantly higher in psoriasis versus psoriasiform dermatitis ($p < 0.001$). A larger number of psoriatic cases showed significant immunostaining, indicating enhanced keratinocyte proliferation and cell cycle activity. Both markers had good sensitivity and specificity, indicating reliable diagnostic performance.

Conclusion: Ki-67 and Cyclin D1 are reliable immunohistochemistry markers that can distinguish psoriasis from psoriasiform dermatitis. Their capacity to detect enhanced cellular proliferation and cell cycle dysregulation improves diagnostic accuracy, especially in histologically unclear situations, allowing for more precise diagnosis and better clinical care.

Keywords: Ki-67, Cyclin D1, Psoriasiform dermatitis, Cell cycle dysregulation, Diagnostic accuracy, Immunohistochemical

Indian J. Pharm. Biol. Res. (2026): https://doi.org/10.30750/ijpbr.14.1.14

Introduction

Psoriasis is a chronic, immune-mediated inflammatory skin condition distinguished by erythematous, scaly plaques and significant epidermal hyperproliferation. In contrast, psoriasiform dermatitis is a diverse group of inflammatory dermatoses that histologically resemble psoriasis but differ in genesis, prognosis, and treatment. Accurate distinction between these entities is critical for optimal treatment; yet, it remains difficult due to clinical and histological signs that overlap, such as acanthosis, parakeratosis, and rete ridge elongation. Histopathological testing is still the gold standard for diagnosis, but small differences may not always be enough for definite distinction. As a result, additional diagnostic methods, particularly immunohistochemistry markers, are increasingly being investigated to improve diagnostic accuracy(1).

Ki-67 is a nuclear protein that is produced during the active phases of the cell cycle and serves as an accurate biomarker of cellular proliferation. Psoriasis is characterized by accelerated keratinocyte turnover, which is likely to be associated with raised Ki-67 levels.

[1]PG JR, Department of Pathology, Hind Institute of Medical Sciences, Mau Atria, Sitapur, India

[2]Professor, Department of Pathology, Hind Institute of Medical Sciences, Mau, Atria, Sitapur, India

[3]Assistant Professor, Department of Pathology, Hind Institute of Medical Sciences, Mau, Atria, Sitapur, India

[4]Professor & HOD, Department of Pathology, Hind Institute of Medical Sciences, Mau, Atria, Sitapur, India

Corresponding Author: Satyendra Kumar Sharma , Associate Professor, Department of Dermatology, Hind Institute of Medical Sciences, Mau, Atria, Sitapur, India

How to cite this article: Shahi I, Tripathi S, Mathur P, Agarwal S. Diagnostic utility of ki67 and cyclin D1 immunostaining in differentiating psoriasis from psoriasiform dermatitis: A clinico-pathological and immunohistochemical study. Indian J. Pharm. Biol. Res. 2026;14(1):66-69.

Source of support: Nil

Conflict of interest: None.

Received: 10/04/2026 **Revised:** 19/04/2026 **Accepted:** 28/04/2026 **Published:** 20/05/2026

Similarly, Cyclin D1 regulates the cell cycle's transition from the G1 to the S phase. Overexpression of Cyclin D1 has been linked to enhanced cellular proliferation in a variety of dermatological disorders(2).

The examination of these markers in psoriatic lesions vs psoriasiform dermatitis may provide useful information about their diagnostic value. Although prior research has found higher expression of these markers in psoriasis, the data is weak and inconsistent. This prospective study will evaluate and compare the expression of Ki-67 and Cyclin D1 in psoriasis and psoriasiform dermatitis, as well as examine their utility as additional diagnostic tools in ordinary clinical practice(3).

Methods

This prospective study was conducted on 70 patients clinically suspected of psoriasis or psoriasiform dermatitis. Skin biopsy specimens were obtained from all participants and subjected to routine histopathological examination followed by immunohistochemical analysis.

Sample Size

A total of 70 cases were included in the study, comprising patients diagnosed clinically with psoriasis or psoriasiform dermatitis. The sample size was determined based on feasibility and availability of cases during the study period.

Study Duration

The study was conducted over a period of 18 Months during which patient recruitment, sample collection, and analysis were performed.

Inclusion Criteria

- Patients clinically suspected of psoriasis or psoriasiform dermatitis
- Patients willing to undergo skin biopsy
- Patients who provided informed consent
- Both male and female patients of all age groups

Exclusion Criteria

- Patients already on systemic treatment for psoriasis (e.g., immunosuppressants, biologics)
- Inadequate or poorly preserved biopsy samples
- Patients with other inflammatory or neoplastic skin conditions
- Patients unwilling to participate or not providing consent

Immunohistochemical staining for Ki-67 and Cyclin D1 was performed using standard protocols. The percentage of positively stained cells was evaluated and graded semi-quantitatively.

Statistical Analysis

The statistical analysis was done out using SPSS software. Continuous variables were presented as mean ± SD, whereas categorical variables were represented as percentages. Group comparisons were made using the independent t-test and the Chi-square test. A p-value of <0.05 was judged statistically significant.

Results

Table 1: Demographic Distribution

Parameter	*Psoriasis*	*Psoriasiform dermatitis*	*p-value*
Number	35	35	-
Mean Age	42.6 ± 12.4	44.1 ± 11.8	0.62
Male (%)	60%	57%	0.81

Table 2: Ki-67 Expression

Expression	*Psoriasis*	*Psoriasiform dermatitis*	*p-value*
High	28 (80%)	10 (28.5%)	<0.001
Low	7 (20%)	25 (71.5%)	

Table 3: Cyclin D1 Expression

Expression	*Psoriasis*	*Psoriasiform Dermatitis*	*p-value*
High	26 (74%)	12 (34%)	<0.001
Low	9 (26%)	23 (66%)	

Table 4: Combined Marker Analysis

Marker	*Sensitivity*	*Specificity*	*p-value*
Ki-67	80%	71%	<0.001
Cyclin D1	74%	66%	<0.001

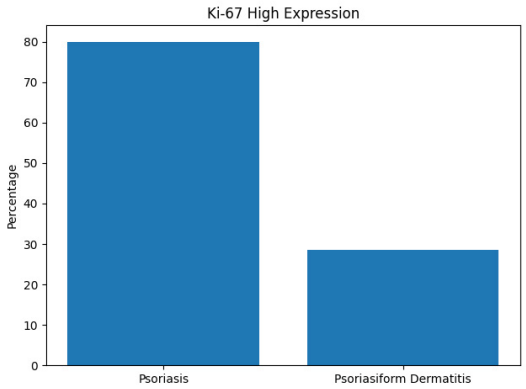

Figure 1: Ki-67 high expression

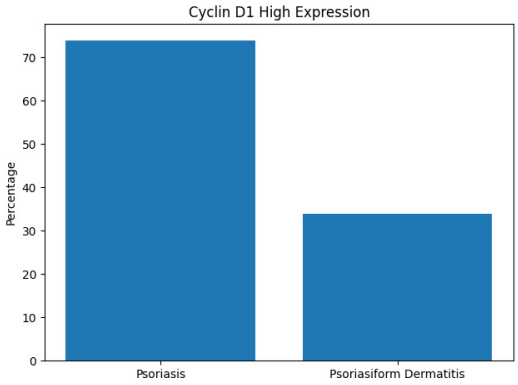

Figure 2: Cyclin D1 high expression

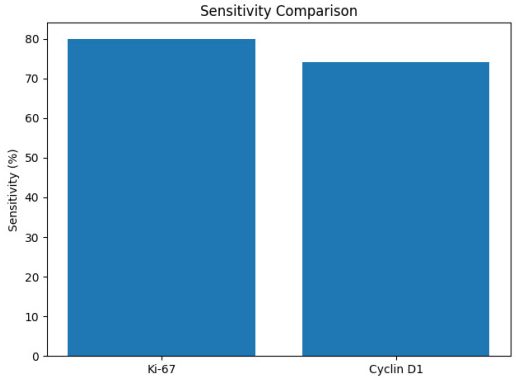

Figure 3: Sensitivity comparison

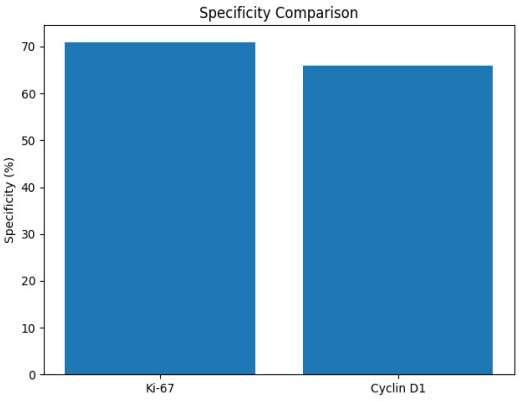

Figure 4: Specificity comparison

Discussion

The distinction between psoriasis and psoriasiform dermatitis remains a key diagnostic problem in dermatopathology due to overlapping morphological features. In this work, we investigated the use of Ki-67 and Cyclin D1 as supplementary immunohistochemistry markers to increase diagnostic accuracy(4). Our data show that Ki-67 expression in psoriasis is much higher than in psoriasiform dermatitis. This discovery matches the well-known hyperproliferative characteristic of the psoriatic epidermis, in which keratinocyte turnover is significantly accelerated. The elevated Ki-67 labeling index in psoriasis confirms its usefulness as a reliable epidermal proliferation indicator(5).

Similarly, Cyclin D1 expression was considerably higher in psoriasis. Cyclin D1 regulates the cell cycle, namely the G1 to S phase transition. Its elevated expression in psoriasis reflects increased cellular proliferation and abnormal cell cycle regulation, both of which are characteristic of the condition(6).

Both markers showed substantial differences ($p < 0.001$), indicating excellent discriminating capacity. Furthermore, combined analysis of Ki-67 and Cyclin D1 improved diagnosis accuracy, indicating that a panel of markers may be more valuable than a single marker. These findings are consistent with earlier research that has shown higher proliferative activity in psoriasis. However, there has been some diversity in expression patterns reported in the literature, which could be related to variances in technique, sample size, and interpretation criteria(7).

Despite the good results, some restrictions must be recognized. The sample size, while appropriate, may not fully capture the variety of psoriasiform dermatitis. Furthermore, immunohistochemistry interpretation may vary depending on the observer. Nonetheless, this study emphasizes the significance of including immunohistochemical markers in routine dermatopathology practice. Ki-67 and Cyclin D1, when combined with histology, can considerably improve diagnostic confidence and eliminate ambiguity(8).

Conclusion

The current study reveals that Ki-67 and Cyclin D1 immunostaining are useful techniques for distinguishing psoriasis from psoriasiform dermatitis. Both markers had significantly higher expression in psoriasis, indicating enhanced keratinocyte proliferation and altered cell cycle dynamics. Ki-67, a proliferation marker, offers information about epidermal turnover, whereas Cyclin D1 indicates cell cycle dysregulation. The combination of these indicators increases diagnosis accuracy and helps to overcome the limits of conventional histology.

These immunohistochemical markers, with their high sensitivity and specificity, can be efficiently integrated

into normal diagnostic workflows, especially in cases when characteristics overlap. However, further large-scale investigations are needed to corroborate these findings and develop consistent interpretation criteria. Overall, Ki-67 and Cyclin D1 are interesting biomarkers for improving the diagnostic precision of dermatopathological examination.

References

1. Vemavarapu K, Reddy SS, Ramya S, Reddy BR. A comparative study of clinicohistopathological correlation in patients of psoriasis and psoriasiform lesions with ki67 and cd34 immunohistochemical expression. Asian J Pharm Clin Res. 2024;17(10):50–5.
2. Sharma RK, Medical G, Amritsar C. Diagnostic Utility Of Ki 67 And Cyclin D1 Immunostaining In Pathology Kaur ABSTRACT. Int J Sci Res. 2022;11(6):62–4.
3. Gagandeep Kaur, RK Sharma, Tejasvin Singh JS. Pathology Differentiation Of Psoriasis Vs Other Psoriasiform Gagandeep Kaur Dr . RK Sharma Tejasvin Singh Dr . Jaspreet. Pathology. 2022;12(1):10–2.
4. Karunanithi G, Mithun KRV. A Study on Diagnostic Utility of Ki-67 Immunostaining in Differentiation of Psoriasis Vs Other Psoriasiform Dermatitis. Int J Pharm Clin Res. 2025;17(1):1009–15.
5. Borade S, Belgaumkar VA, Chavan RB, Bhatt N, Deshmukh NS. Evaluation of IHC Ki-67 with Clinical Correlation in Psoriasis. Serbian J Dermatology Venereol. 2020;12(2):33–40.
6. Sezer E, Böer-auer A, Cetin E, Tokat F, Durmaz E, Sahin S. Diagnostic utility of Ki-67 and Cyclin D1 immunostaining in differentiation of psoriasis vs . other psoriasiform dermatitis. Dermatol Pr Concep. 2015;5(3):7–13.
7. Sri K, Sornam E, Sekar V, Srinivasan S, Kanth S. Enhancing diagnostic precision in psoriasis skin lesions : The role of ki-67 and a three-tier grading approach. J Lab Physicians. 2025;(October):1–6.
8. Kim SAE, Ryu YW, Kwon JUNIL, Choe MISUN, Jung JINW, Cho JAEWE. Differential expression of cyclin D1 , Ki - 67 , pRb , and p53 in psoriatic skin lesions and normal skin. Mol Med Rep. 2018;17(March):735–42.